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Government  
Publications

# FISHERIES AND ENVIRONMENT CANADA

BRITISH

COLUMBIA

## INDEX

Bella Coola R.

## SPECIAL ESTUARY SERIES

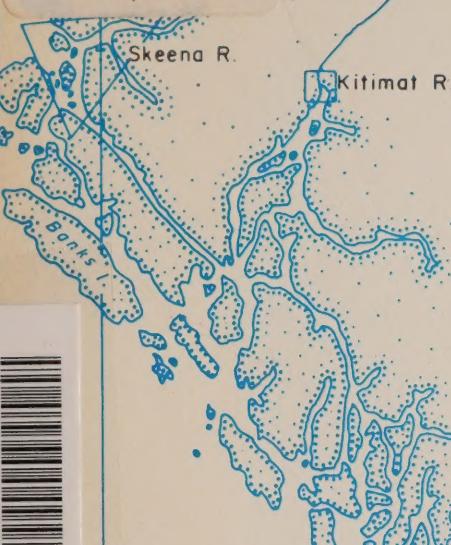
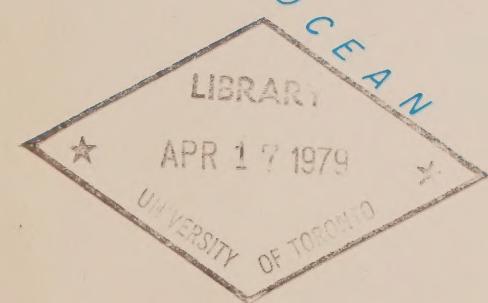
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FISHERIES AND ENVIRONMENT CANADA

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# INDEX

## SPECIAL ESTUARY SERIES VOLUMES 1-6

ESTUARY WORKING GROUP

DEPARTMENT OF FISHERIES AND THE ENVIRONMENT  
REGIONAL BOARD PACIFIC REGION

By

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MARCH 1, 1979

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PREFACE

This INDEX concludes the review of work on 7 of the estuaries of British Columbia commenced in 1974. It was decided during the early 1970's by the Estuary Working Group of the Regional Board of the Pacific Region of the Federal Department of Fisheries and the Environment to collate and summarize all the environmental work that has been conducted on 18 "critical" estuaries of the province. The selected estuaries consist of the Fraser, Squamish, Skeena, Kitimat, Indian, Homathko, Wannock and Bella Coola on the British Columbia mainland coast and the Cowichan, Chemainus, Nanaimo, Campbell, Courtenay, Somass, Quatse, Salmon, Gold and Nimpkish on Vancouver Island. They were chosen on the basis of living resource potential and threat from development. Their locations are shown on the cover of this volume. The Special Estuary Series, the first 6 volumes of which are indexed here for authors and subject matter, have been comparatively widely distributed in major academic libraries of the province, as well as in reference holdings of governmental, educational and private environmental establishments.

When this INDEX was initiated in 1976, Dr. Neal M. Carter was contracted to do the work. Unfortunately, he was unable to continue after indexing the first volume in the Series. However, he was able to guide Adelle J. Leaney in carrying on the indexing of further volumes.

Dr. Carter was well qualified to index scientific works. He had had a brilliant scientific career following the acquisition of his Ph.D. in Biochemistry at McGill University, with: a post-doctoral fellowship in Germany; several years at the Pacific Biological Station in Nanaimo, conducting the first oceanographic work on the Pacific Coast of Canada, including the earliest publications on fjords of British Columbia; Director of the Pacific Fisheries Experimental Station of the Fisheries Research Board in Prince Rupert, and later in Vancouver; and finally, Associate Editor of the Journal of the Fisheries Research Board of Canada. He also edited for many years the Fisheries Research Board's Progress Reports of the Pacific Coast Stations, which were designed to inform fishermen and interested lay persons on current research work in fisheries. Following retirement in 1962, Dr. Carter continued assisting the Office of the Editor of the Fisheries Research Board in Ottawa with

indexing of its various publications. He was responsible for two index volumes, "Index and List of Titles, Fisheries Research Board of Canada and Associated Publications, 1900-1964", and the follow-up one for 1965-1972, which brought together all work of the Fisheries Research Board and its earlier counterparts from 1900 to 1972. He provided annual indexes for the Journal of the Fisheries Research Board after 1972 until 1977, when finally at the age of 75 he felt it was time he retired from indexing.

Dr. Neal M. Carter was also a very avid mountaineer. From his student days as an active participant in the Varsity Outdoor Club in the University of British Columbia through his many years as a member of the B.C. Mountaineering Club and the Alpine Club of Canada, Dr. Carter climbed many mountains in western Canada. He did this in part for recreation, but true to his character, he felt that something more tangible than recreation should be derived from these alpine pursuits. Accordingly, he always carried basic survey instruments on these expeditions to enable him to conduct some mapping. His early engineering training helped in this regard. Dr. Carter was also credited with carrying out some of the earliest photogrammetric surveying of B.C.'s coastal mountains. For his contributions to mountain exploration, Dr. Carter was made an Honorary Life Member of the Alpine Club of Canada.

Dr. Neal Marshall Carter passed away after an active and productive career on March 15, 1978, while vacationing in the Caribbean and engaging in some recreational diving among coral reefs. He will be long remembered not only for his contributions to science and to mountaineering, but also for his friendly nature and his remarkable ability to provide encouragement in counselling people, particularly students and young scientists, on many matters. We owe him a great deal for fostering scientific research in the marine environment and in fisheries on the Pacific Coast of Canada. It is a pleasure to acknowledge his enthusiastic participation in the preparation of this INDEX, one of the last technical projects in which he was involved.

M. Waldichuk

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## INTRODUCTION TO SPECIAL ESTUARY SERIES INDEX

SYMBOLS

The symbols listed below indicate the following:

- 3: designates volume from which information cited (see page iv)
- : 48 designates page on which information is cited
- :IBO: means mentioned *In Bibliography Only*
- :(344) indicates a bibliographic reference source

EXAMPLES

5: 76, 77, 80(257) referenced information located in *Volume 5*, on *pages 76, 77 and 80* and referenced in the *bibliography* of that volume on *page 257*.

1:213, 239(475, 479); 2:IBO:(329, 333, 334) relevant information cited in *Volume 1* on *pages 213 and 239*, and referenced in *bibliography* of that volume on *pages 475 and 479*. Additional source information may be found in the *bibliography* of *Volume 2* on *pages 329, 333 and 334*.

NOTE

- 1 - "re" is often used in the index references to imply "in relation to", etc.
- 2 - All authors mentioned in the Special Estuary Series are indexed. However, it should be noted, that in the present index the primary author has not been specified.
- 3 - During preparation of the Index, errors in the spelling of some names mentioned in Special Estuary Series volumes have been noticed. The authors of this Index have attempted to correct these wherever possible.
  - P. 1 Abbott-Smith, K.B. instead of Abbot-Smith, as in text.
  - P.14 Aro, K.V. instead of Aro, K.U., as in text.
  - P.27 Blackbourn, D.J. instead of Blackbourne, D.J., as in text.
  - Blackbourn, J. instead of Blackbourne, J., as in text.
  - P.44 *Sambucus* instead of *Sambaccus*, as in text 6:201.
  - P.54 *Cirsium* instead of *Cirscium*, as in text 1:281.
- 4 - Organisms are listed alphabetically by genus and then by the specific name. Common names, when given, refer the reader to the scientific names.

SPECIAL ESTUARY SERIES

- No. 1 The Fraser River Estuary Status of Environmental Knowledge to 1974.
- No. 2 The Squamish River Estuary Status of Environmental Knowledge to 1974.
- No. 3 The Skeena River Estuary Status of Environmental Knowledge to 1975.
- No. 4 The Cowichan-Chemainus River Estuaries Status of Environmental Knowledge to 1975.
- No. 5 The Nanaimo River Estuary Status of Environmental Knowledge to 1976.
- No. 6 The Kitimat River Estuary Status of Environmental Knowledge to 1976.

ACKNOWLEDGEMENT

We thank Rose Dawson and Colleen Yuen for their painstaking efforts in typing, proof-reading and correcting this Index prior to its printing.

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- 1:IBO:(473) (trace elements in sewage sludges)

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- 1:IBO:(343) (index to sections & subsections that follow on pages 344-488)

- : (481); 2:IBO:(386); 3:IBO:(393) (coastal/ estuarine pollution)

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- 1:IBO:(343-488); 2:IBO:(245-340); 3:IBO:(295-340);

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- 5:110 (resident seal population)

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- 1:IBO:(410); 3:IBO:(344) (identification of major B.C. & Alaska runs of even and odd-year pink salmon from scale characteristics)

- 3:IBO:(344) (evaluation of sockeye catch samples)

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 :(345) (age, sex & size composition of B.C. sockeye salmon catches)  
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:IBO:(430) (control of columnaris disease in Fraser River sockeye salmon)

Coliform Bacteria (*see* Bacteria)

Collins, F.S.  
5: 91(261) (macrophytic marine algae)

*Collinsia parviflora* (blue-eyed Mary)  
4:212; 6:210 (in species list)

*Collisella pelta* (limpets)  
2: 74 (habitat)  
:189; 5:166, 169 (in species list)

Colls, D.C.  
1:IBO:(442) (summary of data on snow geese wintering populations in Pacific coast region)  
:(442) (aerial waterfowl reconnaissance along B.C. coast)

*Colopsectria* sp. (midge, unspecified)  
6:185 (in species list)

Colour  
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:255-257 (routine determination localities in river basin waters, re water quality)  
6:134 (re Kitimat River)  
:152 (re estuarine log handling & storage)

Coltam, C.  
1:IBO:(392) (biological effects of ditching tidewater marshes)

Coltsfoot  
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(*see* *Petasites frigidus palmatus*)

*Columba fasciata* (band-tailed pigeon)  
1:169, 305 (habitat; food; etc.)  
:IBO:(447); 2:IBO:(316) (experimental studies)  
2:123 (numbers; estuarine movements)  
:213; 3:238; 4:219; 5:188; 6:214 (in species list)  
4:122 (residential status)  
5:109 (inhabit Nanaimo watershed)  
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*Columba livia* (rock dove)  
2:213; 4:219; 5:188; 6:214 (in species list)  
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Columbia Lily (*see* *Lilium columbianum*)

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*Colus* sp. (gastropod, unspecified)  
2:190; 4:194; 6:189 (in species list)

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6:209 (in species list)

Comb Jellies (*see* Ctenophora)

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Common Licorice Fern (*see* *Polypodium vulgare occidentale*)

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*also* under headings for most of the following types)

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- :131 (cat-tail)
- :131-132, 145 (sedge)
- :132, 136, 142 (bulrush)
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- 6: 92 (aster-alder estuary grass & shrubland)
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- : 99, 100 (lowland cedar-hemlock bogs, skunk cabbage bottomlands & Devil's club lower slopes of the lowland coniferous forest)
- :100, 101 (hemlock-balsam mid-slope & blueberry upper slope zones of upland coniferous forest)
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*Anaphalis*; *Antennaria*; *Arctium*; *Aster*; *Chrysanthemum*; *Cirsium*; *Cotula*; *Gnaphalium*; *Hieracium*; *Hypochaeris*; *Matricaria*; *Prenanthes*; *Senecio*; *Tanacetum Taraxacum*)

- 1:IBO:(433); 2:IBO:(306); 3:IBO:(366); 4:IBO:(297) (of the Pacific northwest)
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- 1:264; 3:204; 4:196 (in species list)
- 4: 73 (biomass found in substrates of Cowichan Bay & Satellite Channel)

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- 3:IBO:(297) (Vancouver sulphur disposal)

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- 6:210 (in species list)

*Conioselinum pacificum* (hemlock-parsley)

- 3:113 (foreshore-coastal forest transition zone vegetation)
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- 4:155, 156(312) (re Cowichan Bay log dump)

Connell, R.

- 5: 91(262) (re Departure Bay macrophytes)

Connor, A.J.

- 4:IBO:(273); 5:IBO:(234) (B.C. temperature & precipitation)
- 5:IBO:(234) (B.C. frost-free season)

Connor, J.W.

- 3:IBO:(346) (angler's questionnaire re sport fishing information)

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- :236 (map showing sensitive deltaic fish & wildlife habitats)
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- : (427) (re Fraser River salmon runs)
- : (440) (volunteers)
- : (444); 2:IBO:(314); 3:IBO:(373); 4:IBO:(302) (projects)
- : (445, 460) (re recreational development)
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- 1:201, 211, 332-335 (effluents to air & water from cement, sand, gravel, metal processing, etc.)

Consumers, primary, secondary and tertiary (*see also* carnivore; herbivore)

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- 4:225 (in species list)

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- 1:282 (in species list)

Cook, P.M.

- 1:IBO:(358) (soil report for Sturgeon & Roberts Banks)
- : (358) (soils & foundation report re Roberts Bank development)
- 3:IBO:(297) (soils investigation re drydock site)

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- 1:IBO:(359) (soils report re reclamation for Vancouver Airport expansion)
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Copeland, B.J.  
 1:IBO:(346) (estuarine classification & response to disturbance)

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## Crippen, R.W.

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## Cronin, I.E.

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## Cronin Creek

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## Cronquist, A.

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## Flynn, L.L.

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:(249) (of ecological terms for coastal engineers)  
3:289-290 (land use & development terms)  
5:210-222; 6:238-251 (re general, geological, climatological, oceanographic, hydrological, biological & pollution terms)  
5:210-222; 6:238-251 (geographical terms)

*Glossiphonia* sp. (leech, unspecified)  
4:186 (in species list)

*Glossoma* sp. (primitive caddisfly, unspecified)  
6:185 (in species list)

*Glova*, G.  
5:147(280) (sculpin sensitivity to stream disruption)  
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*Glycera capitata* (polychaeta)  
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*Glycera* sp. (polychaeta, unspecified)  
3:199; 4:191 (in species list)  
6:188 (*G. nana* (in species list))

*Glyceria elata* (tall manna grass)  
3:229 (in species list)

*Glyceria occidentalis* (manna grass)  
3:108 (habitat of)  
:229 (in species list)

*Glyceria pauciflora*  
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*Glyceria striata* (fowl manna grass)  
3:229; 5:180 (in species list)

*Glyceridae* (polychaetes)  
3:199 (in species list)  
6:188 (*G. sp.* (in species list))

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*Glyptocephalus zachirus* (rex sole)  
1:275; 3:216; 4:207 (in species list)  
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4: 97 (juveniles inhabit Cowichan estuary)

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*Gnaphalium* sp. (cudweed, unspecified)  
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*Gnaphalium sylvaticum* (cudweed)  
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: 95 (biotic interactions of *G. oregonensis*)

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3: 88 (estuarine resident)  
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:IBO:(268, 279, 287, 313) (comments on the condition of the Ladysmith Harbour seabed)

Godfrey H.  
1:106(416) (few Fraser River coho salmon fry begin seaward migration immediately after emergence)  
:IBO:(409, 416); 3:IBO:(349) (ages & physical characteristics of maturing chinook salmon of Fraser River, Nass River & Skeena River)  
2:IBO:(295); 3:IBO:(349) (coho, chinook & masu salmon in offshore north Pacific Ocean waters)  
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Golder, H.Q.  
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Goldsborough, E.L.  
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Goodman, D.  
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Goodman, H.  
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Government of Canada  
 1:IBO:(476, 477) (three reports on environmental problems of lower Fraser River Valley & Strait of Georgia)

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Gran, H.H.  
 1:IBO:(432) (diatoms; physical & chemical conditions of San Juan Archipelago seawater)

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Grass, A.L.  
 1:IBO:(400) (some B.C. land & freshwater Mollusca)

Grass and Forb Community  
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 :320 (food of mice)  
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 5: 12, 13, 118 (extent, location, usage & value of Nanaimo deposits)  
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 : 18 (removal permits re holders, displacements & sites)  
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 5:IBO:(273) (economic analysis of Nanaimo)  
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 Gray, F.W.  
 5:IBO:(228) (Canadian coal mining & geology)  
 Gray, J.  
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 5:IBO:(273) (survey of Cowichan & Nanaimo districts)

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 1: 8 (source of information)  
 :184(461); 2:IBO:(324) (population forecast)  
 :186(461) (housing issue)  
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 :(348) (nature of regional government)  
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 :(373) (floodplain & floodproofing in lower Fraser Valley)  
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 :(487) (references to four maps)  
 2:IBO:(323) (report on livability)

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 :147(432) (marine algae near outfall)  
 :202, 207(477) (long range projects for Vancouver domestic organic waste treatment & disposal re marine pollution)  
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 1:327 (aerial census of delta, 1966-1974)

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Green Rein Orchid (see *Habenaria saccata*)

Green Stoneflies (see *Chloroperlidae*)

Green Sturgeon (see *Acipenser medirostris*)

Greenhalgh, W.  
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Greenius, A.W.  
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Greer, B.A.  
 5:140(280) (biological oxygen demand determinations)

Greer, D.M.  
 5:IBO:(273) (re Nanaimo regional planning)

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 4: 79(287) (re intertidal life)

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- :IBO:(443) (census)
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**Gum Weed (*see Grindelia integrifolia*)**

**Gunderson, D.R.**

- 1:IBO:(428) (status of Pacific Ocean perch stocks off B.C., Washington & Oregon)

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**Gunnel (*see Pholis*)**

**Gunter, G.**

- 3:IBO:(389) (oysters & sulphite waste liquor)

**Guppy, R.**

- 4: 71(287) (re insects)

**Guthrie, J.**

- 2:IBO:(331) (effects of Kraft mill effluent on Pacific oyster (*Crassostrea gigas*))

***Gymnocarpium dryopteris* (oak fern)**

- 3:113 (successional forest component)
- :229; 6:208 (in species list)

***Gymnodinium* sp. (dinoflagellate, unspecified)**

- 1:261; 3:219 (in species list)

**Gymnolaemata (*see Bugula; Membranipora; Phidolopora*)**

**Gyrfalcon (*see Falco rusticolis*)**

**Gyrinidae (whirligig beetles)**

- 4:187 (in species list)

H

***Habenaria dilatata* (tall white bog-orchid)**

- 2:207; 6:207 (in species list)

***Habenaria orbiculata* (large round-leaved orchid)**

- 6:207 (in species list)

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- 6:101 (community position; species associations; abundance)

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- 1:236 (map showing estuary areas sensitive for fish & wildlife conservation)
- :293-318 (of estuary birds)
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- 5:IBO:(228) (petrography of Canada in relation to deposition environment)

**Haegele, C.**

- 1:IBO:(422); 3: 87, 93(357) (time & extent of herring spawning along B.C. coast)
- 2: 93(300) (closure of herring season in southern B.C.)

***Haematopus bachmani* (black oyster catchers)**

- 1:IBO:(440); 2:IBO:(311) (Vancouver occurrence)
- :440; 2:IBO:(311) (nesting habitat)
- 2:212; 3:237; 4:218; 5:187 (in species list)
- 4:120 (feeding habitats)
- 5:106 (seasonal estuarine inhabitant)

***Haemobaphes* (Copepoda: Lernaeoceridae)**

- 1:IBO:(401); 2:IBO:(285) (of B.C. waters)

**Hafer, R.A.**

- 3:IBO:(369) (wave measurements from the drilling rig SEDCO-135F)

**Haggen, E.**

- 1:IBO:(369) (oil exploration near Vancouver, in the Fraser Valley & in Fraser delta)

**Haig-Brown, R.**

- 1:IBO:(416) (the Pacific salmon)

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**Hairy Cat's Ear (*see Hypochaeris radicata*)**

**Hairy Manzanita (*see Arctostaphylos columbiana*)**

**Hairy Rockcress (*see Arabis hirsuta*)**

**Hairy Ryegrass (*see Elymus hirsutus*)**

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- Pacific (*see Merluccius productus*)

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- 1:299; 2:122, 123; 3:121 (food of; etc.)
- :299; 2:122, 123; 3:121; 6:107 (habitat)
- :328 (1970 raptor census of delta by areas)
- 2:122, 123 (feeding habits)
- :122, 123; 3:121 (numbers)
- :211; 3:237; 4:217; 5:186; 6:213 (in species list)
- :IBO:(315); 3:IBO:(323) (information source)
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 :157, 161(444) (ducks of river mouth & their feed preferences)  
 :163(348, 444, 461) (migrating & wintering shorebird populations of delta)  
 :164(444) (types & feed of wintering gulls at Vancouver International Airport)  
 :166(444) (Point Grey & Stanley Park herons & their feed)  
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 :233, 237(348, 444, 461); 4:IBO:(302) (Fraser River foreshore & delta importance for consumptive & non-consumptive recreational aspects of delta wildlife resources)  
 :299-300, 318(432, 444) (birds of delta region)  
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 3: 33(318) (fresh water quality of the Skeena drainage system)  
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**Haller, A.M.**  
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 1:IBO:(401) (plankton community, whale fisheries, & animal exclusion hypothesis, in South Georgia whaling grounds)

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 1:IBO:(437) (guide to B.C. common edible plants)

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small  
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3:219 (in species list)

*Pyrus communis* (pear)  
1:288 (in species list)

*Pyrus fusca* (western crabapple)  
1:288; 3:235; 4:215; 5:184; 6:209 (in species list)  
3:113 (floodplain vegetation; foreshore coastal forest transitional zone)  
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6: 96, 98, 102 (abundance; forest position)

*Pyura haustor* (ascidacean)  
2:196; 4:202 (in species list)  
4: 76 (Stuart Channel abundance)

*Pyura* sp.  
2:196 (*P. mirabilis* (in species list))  
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*Quadrigula* sp. (green algae, unspecified)  
3:220 (in species list)

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4:IBO:(277, 290, 300, 317) (study)  
:(299) (report; fish mortality)  
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4: 19 (classification of glacial, interglacial & postglacial events)

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1: 97(404); 2:IBO:(288); 3:IBO:(339); 4:IBO:(288) (edible B.C. molluscs)  
:IBO:(345); 2:IBO:(246) (a brief on mariculture)  
:(351); 2:IBO:(251); 3:IBO:(302) (B.C. shores)  
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:(397, 398); 2:IBO:(282); 3:IBO:(335) (dredging activities re B.C. marine invertebrate surveys)  
:(398); 2:IBO:(283) (breeding & growth of B.C. razor clams)  
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:(404, 405); 2:IBO:(288, 289); 3:IBO:(339, 340, 341); 4:IBO:(289, 290); 5:IBO:(254) (re oysters)  
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:(335); 3:IBO:(392) (shellfish toxicity records)  
3: 77(340) (culture of Pacific oyster (*Crassostrea gigas*) in Nicoll Creek)  
4: 56(280) (environmental effects of pulp mill effluent on Stuart Channel & oyster production)  
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 :(315) (four progress reports re experiments concerning Kraft mill effluent effects on the condition of oysters at Crofton, B.C.)  
 5: 71(254) (introduced species abundance & range)  
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Slaney, F.F. and Company Limited

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 6: 117(279) (possible public marina sites)  
 : 130(279) (re water supply capacity)  
 : 174 (information source)  
 : IBO:(279) (feasibility study re second Kitimat  
     River bridge)  
 : (279) (feasibility study re MK Bay marina)

Swan Wooster Engineering Company Limited and James  
 and Moore  
 3: IBO:(304) (Norport, Prince Rupert)

Swann, L.G.  
 1: IBO:(426) (a century of B.C. fishing)

Swanson, H.S.  
 1: IBO:(374) (flow analysis of water allocation in  
     a river system re effect on estuarine  
     ecology)

Swarth, H.S.  
 1: IBO:(440) (distributional list of B.C. birds)  
 3: 117(371) (general wildlife information)  
 : IBO:(378) (birds & mammals of the Skeena River  
     region of northern B.C.)

Swecker, M.N.  
 1: IBO:(345) (estuarine environmental quality of  
     Upper Grays Harbour, Washington)

Sweet Bedstraw (*see* *Galium triflorum*)

Sweet Cecily (*see* *Osmorhiza purpurea*)

Sweet Gale (*see* *Myrica gale*)

Swiatkiewicz, V.J.  
 2: IBO:(302) (fisheries value & recommendations  
     for their protection — Squamish-  
     Lillooet Regional District &  
     Sunshine coast)

Swift  
 black (*see* *Cypseloides niger*)  
 Vaux's (*see* *Chaetura vauxi*)

Swimming Beaches (*see* Beaches; Recreation)

Swimming Speed of Fish  
 1: 104 (chum salmon upstream in delta)

Swine  
 1: 183 (acreage used for farm production)

Swinnerton, A.A.  
 1: IBO:(367) (Canadian peat moss industry)  
 : (367) (peat in Canada)

Swinnerton, G.S.  
 1: IBO:(470) (small-farm function in Matsqui  
     Municipality, Fraser River delta)

Swishwash Island (in centre of Middle Arm)  
 1: 136 (formed from dredging; now vegetated & in  
     natural state because of inaccessibility)

Sword Fern (*see* *Polystichum munitum*)

Syllidae (polychaetes)  
 1: IBO:(396); 2: IBO:(281); 3: IBO:(334) (west coast  
     Canadian forms)  
 3: 200 (in species list)  
 5: IBO:(249) (Nanaimo varieties)

Syllis (polychaetes)  
 1: 263 (*S. sp.* (in species list))  
 : 263; 4: 192 (*S. alternata* (in species list))  
 3: 200 (in species list)  
 4: 192 (*S. armillaris*; *S. fasciata*; *S. hyalina*;  
     *S. pulchra*; *S. spenceri* (in species list))

Syllis heterochaeta (polychaete)  
 3: 200; 4: 192 (in species list)

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*Sylvester, R.O.*  
 1:IBO:(378) (review of Fraser River basin re water quality)

*Sylvilagus floridanus mearnsi* (eastern cottontail rabbit)  
 1:171, 322 (habitat; food)  
 :299 (as prey of hawk)

*Symporicarpos albus* (snowberry; waxberry)  
 1:141 (on dykes & well-drained slopes)  
 2:209; 3:234; 4:215; 5:182; 6:201 (in species list)  
 6: 96 (community position; species associations)

*Symporicarpos rivularis*  
 2:111 (*Symporicarpos* ecosystem type)

*Synaptomys borealis* (northern bog lemming)  
 2:217; 3:243 (in species list)  
 3:122 (inhabit Skeena region)

*Synchelidium* (amphipod)  
 6:191 (*S. sp.* (in species list))

*Syndiamesa*  
 6:186 (*S. nivosa*; *S. sp.* (in species list))

*Synidotea* sp. (isopod, unspecified)  
 3:207 (in species list)

*Synedra* sp. (diatom, unspecified)  
 1:146 (in freshwater zone (Canoe Pass))  
 2:205, 206; 3:221 (in species list)  
 3:102 (Cronin Creek populations)

*Synedra tabulata*  
 2:206 (in species list)

*Syngnathus griseolineatus* (bay pipefish)  
 1:115 (use of estuarial zone for migration salinity transition)  
 :116, 117 (preferred habitat in Boundary Bay)  
 2: 85 (estuarine resident)  
 :202; 4:206; 5:174 (in species list)

*Synthliboramphus antiquus* (ancient murrelet)  
 3:120 (summer visitors)  
 :238; 4:219; 5:188 (in species list)

*Synura* sp. (algae, unspecified)  
 3:220 (in species list)

*Syrphidae* (flower flies)  
 1:266 (in species list)

*Szczawinski, A.F.*  
 1:IBO:(430); 2:IBO:(304); 3:IBO:(365) (guide to B.C. common mushrooms)  
 :(437); 2:IBO:(309); 3:IBO:(369) (B.C. orchids)  
 :(437); 2:IBO:(309); 3:IBO:(369) (B.C. heather (Ericaceae) family)  
 :(437); 2:IBO:(309); 3:IBO:(369) (guide to B.C. common edible plants)  
 2:IBO:(309); 4:114(300) (Saanich Peninsula flora)  
 4:IBO:(300) (corticulous & lignicolous plant communities in the forest associations of the Vancouver Island Douglas-fir forest)  
 5:101(265) (species found in Nanaimo Douglas-fir zone)

*Szeto, S.Y.*  
 1:126(430, 478) (heterotrophic bacteria counts in Fraser River delta & estuary waters; effects of chlorinated hydrocarbons on such bacteria)  
 :IBO:(479) (factors affecting behaviour of chlorinated hydrocarbons in natural waters & their sediments)  
 6:136(280) (polychlorinated biphenyl levels in Kitimat Arm Dungeness crabs)

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*Tabanidae* (horseflies)  
 1:266 (in species list)

*Tabata, S.*  
 1: 49(374) (Fraser River annual flow at Hope & Port Mann)  
 : 52(374) (tidal effects & salt wedge in Fraser River delta)  
 : 53(374) (turbidity increase re runoff increase in delta)  
 : 72(383, 391) (surface water circulation in Strait of Georgia)  
 : 72(388) (waters of Burrard Inlet & Indian Arm)  
 : 79(388, 389) (current measurements between Sand Heads & Porlier Pass)  
 : 84(406) (shipworms in a tidal basin near Steveston Cannery)  
 :IBO:(383, 387, 388) (sea water intrusions in Steveston Harbour & Cannery basin)  
 :(388) (oceanography of Strait of Georgia re regulation of Fraser River)  
 :(388) (current velocities near Iona Island sewerage treatment plant outfall)  
 2: 98(309) (Squamish estuary phytoplankton)  
 :IBO:(272) (measurement of Strait of Georgia surface flow using free-floating current followers)  
 :(275) (two reports on effect of Fraser River on Strait of Georgia surface waters)  
 :(275) (oceanographic features of Howe Sound)  
 :(275) (three reports on Strait of Georgia current velocities)  
 :(275, 276) (three summaries on Strait of Georgia oceanographic records obtained by moored instruments)  
 :(277) (Strait of Georgia surface currents)  
 3: 39(329) (annual salinity & temperature variations)  
 : 40(323) (Hecate Strait oceanographic studies)  
 :IBO:(329) (heat exchange between sea & atmosphere along the northern B.C. coast)  
 5: 55(247) (Strait of Georgia residual current)

*Tabellaria* (diatom)  
 1:146 (in freshwater zone (Canoe Pass))  
 2:205 (in species list)

*Tabellaria fenestrata* (diatom)  
 3:102 (peak abundance period)  
 :221 (in species list)  
 4:104 (found in Cowichan Lake)

*Tabellaria flocculosa* (diatom)  
 3:221 (in species list)  
 4:104 (found in Cowichan Lake)

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Taber, R.D.  
3:IBO:(379) (ecology of the black-tailed deer)

Tachinidae (dipterans)  
1:266 (in species list)

*Tachycineta thalassina* (violet-green swallow)  
2:214; 3:239; 4:220; 5:189; 6:215 (in species list)

*Tachyrhynchus* (gastropod)  
4:195 (*T. sp.* (in species list))  
5:169 (*T. lacteolus* (in species list))

Tadpole Snailfish (*see* *Nectoliparis pelagicus*)

Tagatz, M.E.  
1:IBO:(481) (reduced oxygen tolerance & toxicity of petroleum products to juvenile American shad)

*Tagelus* (razor clam)  
1:IBO:(398) (breeding; growth)

Takagi, K.  
3:IBO:(361) (timing & migration rate of Babine sockeye stocks through the Skeena & Babine rivers)

Takahashi, M.  
1:150(437) (simulation study of phytoplankton & growth in Fraser River estuary)

Talbot, J.F.  
1:IBO:(452) (wildlife importance in Boundary Bay development)

Taler, D.R.  
1:IBO:(426) (Fraser River sockeye salmon energy expenditure during spawning migration to Chilko Lake)

Talitridae (amphipods)  
6:187 (in species list)

Tall Blue Huckleberry (*see* *Vaccinium ovalifolium*)

Tall Blue Lettuce (*see* *Lactuca biennis*)

Tall Mannagrass (*see* *Glyceria elata*)

*Tamiasciurus douglasii mollipilosus* (Douglas squirrel)  
1:322 (habitat; food)  
2:217 (in species list)

*Tamiasciurus hudsonicus* (red squirrel)  
2:126 (estuarine inhabitant)  
2:217; 3:242; 4:223; 5:192; 6:217 (in species list)  
3:122 (inhabit Skeena region)  
4:124 (residential status)  
5:111 (estuarine inhabitant)  
6:109 (abundance; distribution)

Tan, L.  
6:IBO:(279) (projected population of Kitimat)

*Tanacetum vulgare* (tansy)  
1:286; 6:202 (in species list)

Tanager western (*see* *Piranga ludoviciana*)

Tanaidacea (malacostracan crustacea)  
1:267 (*Tanais sp.* (in species list))  
4:199; 6:191 (in species list)

*Tanais stanfordi* (tanaid)  
6: 74 (identification of)  
:191 (in species list)

Tanner, G.  
1:208(482) (likelihood of new sewage disposal facilities required for disposal of toxic & hazardous substances not now permitted to enter present facilities of Greater Vancouver area)  
:IBO:(483) (wastewater characteristics of Greater Vancouver Regional District treatment plants & major sewers)

Tanner Crab (*see* *Chionoecetes bairdi*)

Tanneries  
1:211 (types of toxic effluents from)

Tannin (*see also* Resin acids)  
1: 55, 56 (levels in estuary waters)

Tansy (*see* *Tanacetum vulgare*)

Tanypodinae  
6:187 (in species list)

*Tanytarsus*  
6:186 (*T. confusa*; *T. sp.* (in species list))

*Taraxacum officinale* (dandelion)  
1:286; 4:214; 5:182; 6:202 (in species list)  
4:111 (found in grazed portions of Cowichan estuary)

*Taricha granulosa granulosa* (Pacific coast newt)  
1:324 (habitat; food)  
2:219; 3:244; 4:225; 5:193; 6:219 (in species list)

Tarplee, W.H.  
5:147(282) (fish production & stream cover)

Task Force Committee for Provincial Interagency Evaluation of Prince Rupert  
3:IBO:(320) (summary report on water quality evaluation of Prince Rupert Harbour & associated environs)

Task Force Technical Working Group  
1:IBO:(470); 4:IBO:(309) (report re Strait of Georgia & Juan de Fuca national marine parks)  
2: 83(290) (invertebrate fisheries in the Howe Sound area)  
: 96(302) (Howe Sound sports fishery)  
: 107(309, 326) (Arbutus subzones)  
: 120(319) (Howe Sound seabird colonies)

Tatersal, W.M.  
5:IBO:(254) (western Canadian Euphausiacea & Mysidacea)

Tatum, J.B.  
4:121(303) (abundance of *Larus philadelphia* & *Larus canus*)  
5:108(269) (residential status of pigeon guillemot, marbled murrelet & Cassin's auklet)

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*Taxus breviflora* (yew)  
 3:115 (muskeg flora)  
 :234 (in species list)

Taylor, F.A.  
 1:IBO:(352) (report on lower Fraser River & Strait of Georgia)

Taylor, D.G.B.  
 1:190 (beaches & marinas; re park potential of Boundary Bay & Point Roberts area)  
 :IBO:(470); 2:IBO:(326) (concept of development rights)

Taylor, E.W.  
 1: 2(348) (area of estuarine influence, Fraser River delta)  
 : 97(406) (Mud Bay production of cultured oysters)  
 :117(452) (Boundary Bay herring production)  
 :127(406) (alluvial deposits in delta)  
 :134, 139, 145, 146(406) (wildlife fauna ecology of Mud & Boundary bays)  
 :157(452) (ducks stopping at river mouth)  
 :174(452) (trend in numbers of waterfowl hunters in B.C.)  
 :235(452) (delta areas cited for recreational development)  
 :IBO:(452) (hunter use of delta area)  
 : (452) (wildlife & recreation potential of Boundary Bay)  
 : (452) (proposed migratory bird refuge on west coast of Vancouver Island)  
 : (453) (the Reifel Refuge in lower mainland waterfowl complex)  
 : (453) (possible impact of Vancouver Airport on estuary wildlife)  
 : (453) (distribution of food habits of north Pacific Ocean fur seals)  
 : (453); 2:IBO:(320); 3:IBO:(379) (inventory of wildlife data for eighteen selected B.C. estuaries)  
 : (453); 2:IBO:(320); 3:IBO:(379); 5:IBO:(269) (land capability for wildlife & waterfowl)  
 : (453); 3:IBO:(379); 4:IBO:(303) (marine associated birds of B.C. coast)  
 : (453); 4:IBO:(304) (importance & problems of estuaries from a wildlife viewpoint)  
 : (453, 461) (proposal for wildlife & recreation, Lulu Island foreshore)  
 2:121(319) (seabird movements)  
 :IBO:(249); 3:IBO:(299); 4:IBO:(264, 283, 302) (human impact on estuarine habitat)  
 4:117(304) (importance of foreshore to waterfowl production & wintering)

Taylor, F.H.C.  
 1:IBO:(453) (distribution & food habits of north Pacific Ocean fur seals)

Taylor, F.J.R.  
 5: 48, 93(245, 265) (re *Mesodinium rubrum*)  
 :IBO:(255) (red water ciliate *Mesodinium rubrum* & its incomplete symbionts)

Taylor, G.D.  
 4: 52(277) (Cowichan River clarity, pH & oxygen concentration)  
 : 95(296) (rainbow trout distributions)  
 :114(300) (successional stage of Cowichan Valley)

Taylor, G.T.  
 1:111(426) (steelhead trout movements in Fraser River estuary)

2:IBO:(302) (distribution, age & food of northeast Pacific Ocean steelhead trout (*Salmo gairdneri*))

Taylor, R.  
 2:163(336) (Howe Sound mercury levels)

Taylor, R.L.  
 1:IBO:(437) (University of British Columbia campus plants)

Taylor, T.M.C.  
 1:IBO:(437) (Sturgeon Bank estuary plants)  
 : (437); 2:IBO:(309) (B.C. ferns & fern-allies)  
 : (437); 2:IBO:(309) (B.C. lily family)  
 : (437); 2:IBO:(309) (preliminary checklist of B.C. vascular flora)  
 : (437); 2:IBO:(309) (B.C. rose family)

Taylor, W.  
 2:IBO:(261) (glacier retreat in Garibaldi Park)

Tea, Labrador (*see* *Ledum groenlandicum*)

Teal  
 blue-winged (*see* *Anas discors*)  
 cinnamon (*see* *Anas cyanoptera*)  
 common (*see* *Anas crecca*)  
 green-winged (*see* *Anas carolinensis*)

Teal, J.  
 1:IBO:(352) (life & death of a salt marsh)

Teal, J.M.  
 1:IBO:(437) (total energy balance in salt marsh grasses)

Teal, M.  
 1:IBO:(352) (life & death of a salt marsh)

*Tealia coriacea*  
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*Tealia crassicornis*  
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*Tealia* sp.  
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*Tegella robertsoni* (bryozoan)  
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 3: xx (channels part of the Skeena's flow into southern Chatham Sound & Hecate Strait)  
 : 60 (depth & navigation method)

*Telepsavus costarum* (polychaete)  
 4:193 (in species list)

*Tellima grandiflorum* (fringecup)  
 4:214; 6:210 (in species list)

*Tellina buttoni* (bivalve)  
 4:197 (in species list)

*Tellina carpentri* (Carpenter tellen clam)  
 1: 90 (in Sturgeon Bank tidal marsh)  
 4:197 (in species list)

*Tellina nuculoides* (bivalve)  
 3: 74 (associations)  
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 3:204 (in species list)

*Telmatodytes palustris* (long-billed marsh wren)  
 1:309 (habitat; food; etc.)  
 2:214; 3:240; 4:221; 5:189 (in species list)

*Telmessus cheiragonus* (decapod)  
 4:200 (in species list)

Temperature  
 1: 30-34, 36-39 (pattern; of estuary)  
 : 30-34, 36-39; 2: 30; 5: 24 (averages - annual; seasonal; monthly; mean)  
 : 30-34, 36-39, 244; 2: 31; 3: 20, 4: 39 (means - seasonal; January & July; annual; range in; daily; annual daily)  
 : 52, 57 (water, of river at Hope)  
 :225 (effect of insolation on infauna of shallow tidal flats)  
 :225-226 (effects on development of lower river food chains)  
 :244; 2: 30; 3: 20; 4: 39; 5: 19; 6: 26 (extremes - monthly; seasonal; mean)  
 :244; 4: 39; 5: 19, 24 (frost - days with; days without; factors effecting occurrence of; at Vancouver International Airport, 1937-74)  
 :IBO:(370); 2:IBO:(263); 3:IBO:(315) (data 1941-1970; trends)  
 :(383, 386); 2: 49; 3: 52, 53(329); 5:IBO:(244) (variation - coastal water; re runoff fluctuations; re spring & summer; seasonal)  
 :(383, 386); 3:IBO:(324, 325, 326); 5:IBO:(240, 241, 242, 255) (observation - coastal; shore station, of seawater)  
 :(390) (Strait of Georgia)  
 2: 30; 6:IBO:(260) (normal - monthly; Canadian)  
 : 31 (influences upon; basic regime)  
 : 50 (riverine & Howe Sound temperatures)  
 : 50; 4: 58; 5: 50, 52; 6: 55 (distribution - Howe Sound surface; Stuart Channel; Sansum Narrows; seasonal; spacial; vertical)  
 :153 (re pulp mill effluent)  
 :155 (re benthic organisms)  
 :IBO:(263); 3:IBO:(315) (tables; fluctuations)  
 :(266); 5: 23; 6: 21 (estuarine sampling stations)  
 3: 52 (accumulation of interior characteristics re)  
 : 52, 53 (impact on estuary; re mixing)  
 :IBO:(326) (time series)  
 4: 39 (moderating influences)  
 :IBO:(273); 5:IBO:(233); 6:IBO:(259) (B.C. tables)  
 :(280) (Cowichan Bay)  
 5: 19 (hours of sunlight)  
 :IBO:(234) (B.C.)  
 :(241) (graphs)  
 :(241, 242) (sea surface)  
 6: 26 (re site consistency of; continental modification of; nature & effects of interior air flow)  
 : 53 (vertical profile)  
 :IBO:(264) (Kitimat Arm)

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 :266 (mention of synonymy with Chironomidae)  
 2: 71; 3: 65 (larvae as food of salmon fry)  
 3:xxii (drainage system benthos)  
 : 64, 65 (in Lakelse Lake & Babine Lake)  
 : 65 (pollution tolerance)  
 : 66 (found in Stumaun Creek)

: 69 (abundance in Ridley Island red liquor discharge cove)  
 :206; 4:187; 6:185 (in species list)

4:xxi (upper Cowichan River inhabitants)  
 : 71, 78 (Cowichan Lake & delta populations)

6: 72 (as salmonid food resource)  
 : 74 (identification of)  
 : 80 (chum consumption of)

*Tener, J.S.*  
 1:146, 295-301, 318(437) (duck habitats on islands & tributaries of Fraser River mainstem as far east as Chilliwack)  
 2:IBO:(320) (lower Fraser Valley Anatinae investigation)

*Tenthredinidae* (sawflies)  
 1:267 (in species list)

*Tera Environment Resource Analysis*  
 3: 9(314) (ecological effects of port development)  
 : 10(314) (bedrock geology of port sites)  
 : 15(314) (estuarine soils)  
 :108(369) (littoral vegetation)  
 :112(369) (plant populations of drainage basin &/or estuary)  
 :114(369) (marsh salinities & associated vegetation)  
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 :121(379) (blue grouse (*Dendragapus obscurus*) habitat)  
 :123(370) (feeding habitats of black-tailed deer)  
 :124(379) (killer whales (*Orcinus orca*), Dall's porpoise (*Phocoenoides dalli*) & harbour porpoise (*Phocoena phocoena*) sighted in estuary)  
 :125(379) (eulachon runs & seal migrations)  
 :127(379) (recreational use of wildlife)  
 :128(379) (trapping of fur bearers)  
 :142(304) (port development versus forest wealth)  
 4:IBO:(310) (Ladysmith Harbour resource analysis)

*Terebella* (polychaete)  
 4:193 (*T. robusta*; *T. sp.* (in species list))

*Terebellidae* (polychaetes)  
 3:202; 6:189 (in species list)

*Terebellides* (polychaetes)  
 1:263; 3:202; 4:193 (*T. stroemi* (in species list))  
 4: 74 (biomass of *T. stroemi* found in Stuart Channel substrates; ecological significance)  
 : 78 (inhabitat Cowichan estuary)

*Terebratalia* sp.  
 2:188 (in species list)

*Terebratalia transversa* (brachiopod)  
 2:188; 3:209 (in species list)

*Terebratulina unguicula* (brachiopod)  
 2:188; 3:209 (in species list)

*Teredo* (*see* *Bankia*)

*Terhune, L.D.B.*  
 3: 40(329) (water exchange between Chatham Sound & the open ocean)  
 :IBO:(323) (wave suppression in the Hecate model)

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## Terpenes

1:212 (in effluents from wood products industries)

## Terrace

3:IBO:(295) (history)  
 :(308); 6:IBO:(256) (geology)  
 :(309) (activity report)  
 :(309, 397) (map)  
 :(310) (mineral deposits; dyke petrology)  
 :(313) (exploration potential)  
 :(313, 384) (hot springs)  
 6:IBO:(258) (granitic rocks)

## Terrapin

Pacific (see *Clemys marmorata*)

## Terzaghi, K.

1:IBO:(367) (varieties of sub-marine slope failures)  
 :(367) (discussion of paper by Mathews & Shepard (1962) on sedimentation of Fraser River delta)

## Testacida

1:260 (in species list)

## Tester, A.L.

1:IBO:(426); 2:IBO:(302) (B.C. herring catch statistics to 1943-44)  
 :(426); 2:IBO:(302); 3:IBO:(361) (efficacy of catch limitations in regulating B.C. herring fishery)  
 :(426); 2:IBO:(302); 3:IBO:(361) (estimation of recruitment & natural mortality rate from age composition & catch data in B.C. herring populations)  
 3: 87(361) (Pacific herring fishery)  
 4:IBO:(296) (herring mortality along southeast coast of Vancouver Island)

## Tetrachlorobenzoquinone

2:154 (toxic component in bleached Kraft mill effluent)

## Tetrachlorocatechol

2:154 (toxic component in bleached Kraft mill effluent)

*Tetraphis pellucida*

3:226 (in species list)

*Tetraspora* sp.

2:103 (location of)  
 :206 (in species list)

*Tetrastemma* sp. (ribbon worm, unspecified)

6:188 (in species list)

## Tevendale, T.J.

4: 52(314) (Cowichan Bay shellfish-growing-water sanitary survey)  
 :149(316) (origin of high Ladysmith Harbour coliform counts)

*Thais emarginata* (gastropoda)

2:190; 3:203; 4:195 (in species list)

*Thais lamellosa* (dog winkle)

1: 88 (in Boundary Bay area)

2: 75, 148 (in booming grounds)

:190; 3:203; 4:195; 5:166; 6:169 (in species list)

4: 76 (Stuart Channel abundance)

*Thais* sp. (gastropod, unspecified)

3:xxii (habitat)

: 70 (pollution tolerance of)

:203; 4:195 (in species list)

## Thakore, A.N.

1:200(478) (resin acid soaps, fatty acids & sodium salts of Kraft pulp mill wastes toxicity to young coho salmon)  
 2:IBO:(332) (identification of Kraft pulping effluent toxic to juvenile coho salmon (*Oncorhynchus kisutch*))

*Thalassionema nitzschiooides* (diatom)

1:291 (in species list)

*Thalassiosira condensata* (diatom)

1:291 (in species list)

*Thalassiosira decipiens* (diatom)

1:291 (in species list)

*Thalassiosira nordenskoldii* (diatom)

1:150 (most heavily grazed by zooplankton in Strait of Georgia near Fraser River mouth)

*Thalassiosira* sp. (diatom, unspecified)

1:149 (in Strait of Georgia phytoplankton)  
 2:205 (in species list)

4:106 (dominant spring bloom species)

*Thalassiothrix frauenfeldii* (diatom)

1:291 (in species list)

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*Tringa melanoleuca* (greater yellowlegs)  
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Tripp, R.B.  
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 3: 40(329) (salmon migration re behaviour of Nass & Skeena rivers)  
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*Troglodytes aedon* (house wren)  
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 5:IBO:(277) (Nanaimo regional planning design)

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Trussell, P.C.  
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 :(475) (water quality monitoring programme)

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 3: 34 (color, pH, total dissolved solids, Secchi disc depth & organic matter observations for Stumaun Creek, Neaxtoalk, Prudhomme & Rainbow lakes)  
 :IBO:(311, 383) (culture)

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 3: xv (re purpose & activities)

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 :109 (preferred drainage & soil types)  
 :109 (as transition zone vegetation)  
 :112 (coastal forest component)  
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 1: 78(389) (Strait of Georgia water properties & factors affecting its fisheries)

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- 1:149(389) (Fraser River as source of silicon, & Strait of Georgia as source of phosphorus, for supplying nutrients for diatoms)
- :IBO:(384) (some oceanographic features of Juan de Fuca Strait)
- :(389) (non-tidal currents in approaches to Juan de Fuca Strait)
- :(389) (oceanography in Vancouver approaches)
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- 2:IBO:(276) (Strait of Georgia water properties & influencing factors)
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- 5:IBO:(234) (B.C. resource atlas)

Turner, J.A.

- 1:IBO:(371) (intense drying periods over southern B.C. coast)

Turner, M.

- 1:IBO:(482) (land, air & water pollution in Greater Vancouver Regional District)

Turner, R.D.

- 1:IBO:(470) (B.C. provincial park planning)

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Tutt, B.

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United States Department of Agriculture  
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United States Department of the Interior  
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United States Department of Transportation, Coast Guard  
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United States Federal Water Pollution Control Administration  
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University of British Columbia, Faculty of Forestry  
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University of British Columbia, School of Community and Regional Planning  
 1:IBO:(471) (study of selected cases of physical evaluation of Greater Vancouver residential land subdivision)  
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 1:IBO:(453) (waterfowl population survey in Fraser River mouth)

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 3:IBO:(351, 352) (herring spawn abundance in coastal B.C. waters)

Webb, L.A.  
 2:IBO:(297) (herring spawn abundance in coastal B.C. waters)

Webb, P.W.  
 2:150(338) (effects of sodium pentachlorophenate on salmon)  
 3:IBO:(395) (effects of whole bleached Kraft mill effluent on growth & food conversion efficiency of underyearling sockeye salmon)  
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 1:IBO:(473) (trace elements in sewage sludge)

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 :IBO:(325) (Prince Rupert Harbour interagency study on oceanography, water quality & intertidal beach biology)

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Weed, A.C.  
 5:IBO:(257) (notes on a Vancouver Island fish collection)

Weed  
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Weeds (Note: many forms have a name ending in - weed, e.g. duckweed; these are indexed under such names) (*see also* names of species)  
 1:280-287; 2:207-208; 3:227-233; 4:212-214; 5:181-182 (species list including)

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Weir, W.  
 1:IBO:(391) (current measurements & tidal analysis re Boundary Bay reclamation)

Wells, O.  
 4: 6(310) (original extent of Vancouver Island agricultural lands)

Wennekens, M.P.  
 1: 88(407) (depth re infaunal invertebrates of upper foreslope sediments of western Fraser River delta front)

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 :(338); 3:IBO:(396) (natural decay of immersed wood particles; data record)  
 3:159 (hydrogen sulphide gas found in Wainwright Basin)

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Wersta, E.  
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West, G.A.  
 1:IBO:(428) (lower B.C. mainland reports)

Wester, J.  
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 1:IBO:(381) (Fraser River hydraulic model studies on trifurcation, siltation & Fraser-Surrey dock extension)  
 4: 40(274) (Chemainus Harbour wind records)

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 1:IBO:(376) (engineering & economic study of Fraser Valley water supply)

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1: 8 (source of information)  
 : 59(354) (Fraser River delta water flow, bacterial & chemical composition)  
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## Weymouth, F.W.

1:IBO:(407) (B.C. Dungeness crab life history; fishing methods & grounds)

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## Whale

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4:IBO:(288) (distribution of oyster larvae & spat in relation to some environmental factors in a tidal estuary)

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## White, F.D.

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 :(256) (effect of salinity & pH variations on Canadian Pacific coast wood borers)  
 :(256) (notes on breeding season of *Bankia setacea*)

## White, W.R.H.

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 6:IBO:(258) (B.C. Cordilleran tectonics)

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 : 86 (some octopoid species found near)  
 : 99 (commercial & recreational Dungeness & rock crab fishery; legal size; catches)  
 :140 (urbanization; beaches; eelgrass beds)  
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 :(272) (fossils from the Nanaimo Group of the Vancouver Cretaceous)

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## Whitesel, L.E.

1:108(412) (factors affecting lake exit of various sockeye salmon races in Fraser River system)

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## Whitford, H.N.

1:IBO:(438) (B.C. forests)

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## Whitney, R.R.

1:112(420) (American shad homing migrations re water temperatures & spawning in Fraser River)  
 2:IBO:(298) (water temperature & the migration of American shad)

## Whittlesey

6:129(276) (re Kitimat Service Center)  
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## Wick, W.O.

1:IBO:(454) (managing Pacific coast estuarine wildlife in a competitive, multiple-use society)

## Wickett, W.P.

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 5: 91(266) (*Alaria* variations & *Laminaria* taxonomy, distribution & ecology)

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Widgeon Keys Organizers Limited  
 1:IBO:(472) (Boundary Bay project to be known as Widgeon Keys)

Widow Rockfish (*see* *Sebastodes entomelas*)

Wiebe, J.  
 1:IBO:(452) (wildlife importance in Boundary Bay development)

Wiens, J.H.  
 1:IBO:(368) (buffering acid soils of lower Fraser Valley)

Wilby, G.V.  
 1:112(412) (American shad in Fraser River)  
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Wilcox, D.  
 1:IBO:(472) (open space & Boundary Bay)

Wild, R.  
 6:IBO:(277) (Kitimat, B.C. - Tomorrow's City Today)

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Wild Currant (*see* *Ribes* sp.)

Wild Ginger (*see* *Asarum caudatum*)

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Wild Rice  
 1:IBO:(431) (experimental planting)

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 1:xvii, 236(453); 2:IBO:(320); 4:115 (importance of estuary to)  
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 :(443) (lower mainland management)  
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 1:IBO:(354) (physical aspects of estuaries)

Wilke, F.  
 1:IBO:(453); 2:IBO:(320) (distribution & habits of north Pacific Ocean fur seals)  
 :(454) (food of sea otters & harbour seals at Amchitka Island, Alaska)

Wilkinson, A.T.S.  
 1:IBO:(454) (gut content of birds from Vancouver International Airport)

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 1:IBO:(395); 2:IBO:(280); 3:IBO:(333, 364) (fish & game in B.C.)  
 :(428); 2:IBO:(303); 3:IBO:(333, 364) (rod & creel in B.C.)  
 3:122(379) (wildlife species hunted in Skeena area)

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Williams, P.M.  
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Williamson, H.C.  
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 2:IBO:(303) (Pacific salmon migrations; tagging operations report)

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Willis, Cunliffe, Tait and Company Limited  
 1:IBO:(472) (feasibility study on the S. Spetifore and Sons Limited, Boundary Bay farm)  
 :(472) (proposed development for the Semiahmoo Indian Reserve, Boundary Bay area)  
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 4:105(300) (Quamichan Lake fish kills)  
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 1:IBO:(369) (engineering evaluation of the tsunami of the 1964 Alaska earthquake)

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 5:IBO:(256) (parasitic copepods from Nanaimo B.C. (including eight new species))

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 5:IBO:(232) (The Granby Consolidated Mining, Smelting & Power Company's colliery at Cassidy, Vancouver Island)

Wilson, W.A.  
 3:IBO:(364) (survey of B.C. commercial fishermen's incomes)  
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 : 35; 3: 24, 25; 4: 33, 34; 6: 28 (wind roses - Squamish; Prince Rupert; Lawyer Island; Victoria; Chemainus; Kitimat Townsite)  
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- 3:IBO:(331) (five Skeena Salmon Management Committee annual reports)
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- 2:IBO:(248) (glossary of geology)

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- 1:201(478) (toxic levels of various water pollutants)
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- 1: 79(388); 2:IBO:(275) (three reports on current velocity measurements in Strait of Georgia)

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- 1:IBO:(430) (occurrence & control of *Columellaris* disease in Fraser River sockeye salmon)
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 5:184 (in species list)

Woodsworth, G.J.  
 3:IBO:(313, 314) (multiple regression as a method of estimating exploration potential in Terrace area of B.C.)

Woodward Island  
 1:132 (flora)

Woodward's Landing  
 1: 84 (*Bankia setacea* (shipworm) presence re salt wedge intrusion into river as far as)

Woody Cinquefoil (*see* *Potentilla villosa*)

Worm  
 arrow or bristle-jawed (*see* *Chaetognatha*)  
 bristle (*see* *Nereis*)  
 burrowing (*see* *Arenicola*; poly-chaeta)  
 earth  
 ship (*see* *Lumbricus*)  
 (*see* *Bankia*)

Worms (unspecified)  
 1:163 (as food of mergansers)  
 :301 (as food of plover)  
 :302 (marine, as food of plover)  
 :319 (as food of shrew)  
 :324, 325 (as food of mammals)  
 :326 (food of amphibians)

Wormwood  
 common (*see* *Artemisia douglasiana*)  
 (*see* *Artemisia campestris*; *Artemisia suksdorfii*)

Wowchuk, R.M.  
 3:IBO:(364) (G.B. Reed groundfish cruise)

Wren  
 Bewick's  
 house  
 long-billed marsh  
 rock  
 winter (*see* *Thryomanes bewickii*)  
 (*see* *Troglodytes aedon*)  
 (*see* *Telmatodytes palustris*)  
 (*see* *Salpinctes obsoletus*)  
 (*see* *Troglodytes troglodytes*)

Wright, A.J.  
 4: 6(310) (early history of City of Duncan)  
 : 10(310) (Chemainus lumber production)  
 :111(310) (Duncan & the Cowichan Valley during the depression years)

Wright, J.B.  
 1: 35(371) (Greater Vancouver average annual precipitation)  
 :IBO:(370) (the unusual winter of 1968-1969 in B.C.)  
 : (370); 2:IBO:(263); 3:IBO:(315) (northwest wind development at Vancouver)  
 : (371) (Vancouver's longterm weather trends)  
 : (371) (precipitation patterns over lower Fraser River Valley)  
 : (371) (Fraser River estuary climatological data)  
 : (371) (fog incidence at Vancouver International Airport)  
 5:IBO:(235) (climate of the Nanaimo River estuary & its effect on proposed port development)

Wright, J.C.  
 1:IBO:(369) (effect of boron application on certain Fraser Valley soils)

Wright, L.D.  
 1:IBO:(346) (procedures & rationale for analysis of major river systems & their deltas)  
 : (491) (variations in morphology of major river deltas as functions of ocean wave & river discharge regimes)

Wright Engineers Limited  
 3:175(385) (renovations of port)  
 :IBO:(305) (Prince Rupert port development)  
 : (396) (report on Cronin Mine tailings pond design)

Wyder, J.E.  
 1:IBO:(369) (correlation of Boundary Bay area Pleistocene glacial tills)

Xanthidium antilopaeum polymatum (green algae)  
 4:104 (found in Cowichan Lake)

Xanthocephalus xanthocephalus (yellow-headed blackbird)  
 1:313 (habitat; food; etc.)  
 2:215; 4:222; 6:216 (in species list)

Xanthoria (lichens)  
 1:279 (in species list)

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*Xema sabini* (Sabine's gull)  
3:238; 4:219 (in species list)

*Xiphister atropurpureus* (black prickleback)  
4:208; 5:174; 6:196 (in species list)

Y

*Yarrow* (*see Achillea millefolium*)

**Yates, A.N.**  
3:IBO:(362) (four reports on B.C. landings of trawl-caught groundfish by month & major statistical area)  
5:IBO:(256) (experimental prawn trap fishing)

*Yellow Cedar* (*see Chamaecyparis nootkatensis*)

*Yellow Paintbrush* (*see Castilleja unalaschoensis*)

*Yellow Pond Lily* (*see Nymphaea polysepala*)

*Yellow Violet* (*see Viola glabella*)

*Yellow Water Lily* (*see Nuphar polysepala*)

*Yellowfin Sole* (*see Limanda aspera*)

*Yellowlegs*  
greater (*see Tringa melanoleuca*)  
lesser (*see Tringa flavipes*)

*Yellowmouth Rockfish* (*see Sebastes reedi*)

*Yellowtail Rockfish* (*see Sebastes flavidus*)

*Yellowthroat* (*see Geothlypis trichas*)

*Yoldia* (*see also Clams*)  
1:264; 3:205; 4:197 (*Y. amygdalea* (in species list))  
2:264; 4:197 (*Y. ensifera* (in species list))  
4:197 (*Y. myalis* (in species list))

*Yoldia* sp. (bivalve, unspecified)  
2:191; 4:198 (in species list)  
4: 73 (biomass found in substrates of Cowichan Bay & Satellite Channel)

*Yoldia thraciaeformis* (bivalve)  
1:265; 4:198 (in species list)  
4: 73 (biomass found in substrates of Stuart Channel; ecological significance)

**Yole, R.W.**  
4:IBO:(272) (Vancouver Island Upper Palaeozoic stratigraphy)

*Yorkshire Fog* (*see Holcus lanatus*)

**Young, S.P.**  
3:IBO:(375) (Alaskan mammal distribution)

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*Zalerion maritimum* (marine fungus)  
1:278 (in species list)  
4:107 (abundance & classification)  
5: 91 (inhabits Nanaimo region)

*Zalophus californianus* (California sea-lion)  
2:218; 4:224 (in species list)

*Zannichellia palustris* (horned pondweed)  
3:233 (in species list)

*Zapodidae* (jumping mice) (*see also Zapus trinotatus*)  
3:242 (in species list)

*Zaprora silensis* (prowfish)  
3:218 (in species list)

*Zapus hudsonicus hudsonicus* (meadow jumping mouse)  
3:218 (in species list)

*Zapus princeps saltator* (western jumping mouse)  
3:242 (in species list)

*Zapus trinotatus trinotatus* (northwestern jumping mouse)  
1:321 (habitat; food)  
2:217 (in species list)

*Zea mays*  
1:135 (in delta pasture land)  
:183 (acreage used for silage production)

**Zealand, G.S.**  
6: 6(253) (historic Kitimat logging operations)  
:127(276) (re logging)  
:IBO:(284) (environmental quality objectives)

*Zenaida macroura* (mourning dove)  
1:169, 305 (habitat; food; etc.)  
2:213; 4:219; 5:188; 6:214 (in species list)  
4:122 (residential status)  
5:109 (inhabit Nanaimo watershed)  
6:108 (occurrence of)

**Zinc**  
1: 55, 58, 59; 4:IBO:(278) (ion levels in estuary waters)  
: 90 (in Sturgeon & Roberts banks marine macrofauna)  
2:212, 213 (ion & metal in industrial effluents)  
:255-257 (ion determination localities in river basin waters, re water quality)  
3: 33 (levels in Cronin Creek)  
4:IBO:(278, 284, 311, 312) (re Crofton oysters)  
:(315) (re *Crassostrea gigas*)

*Zoantharia* (*see also Anthopleura; Pachycerianthus*)  
1:261 (unspecified, in tide pools)  
2:187 (in species list)

*Zoanthidea* (small anemone-like anthozoans) (*see Epizoanthus scotinus*)

**Zonalio, G.W.**  
1:IBO:(472) (report on small craft harbour, Ladner)

*Zonotrichia albicollis* (white-throated sparrow)  
3:241; 4:223 (in species list)

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*Zonotrichia atricapilla* (golden-crowned sparrow)  
 1:315 (habitat; food; etc.)  
 2:216; 3:241; 4:223; 5:191; 6:217 (in species list)

*Zonotrichia leucophrys* (white-crowned sparrow)  
 1:315 (habitat; food; etc.)  
 2:216; 3:241; 4:223; 5:191; 6:217 (in species list)

*Zonotrichia nuttalli* (Nuttall sparrow)  
 3:241 (in species list)

*Zonotrichia querula* (Harris' sparrow)  
 1:315 (habitat; food; etc.)  
 4:222 (in species list)

Zooplankton (*see also* Food Chains)  
 1: 94-96, 207-274; 2: 81; 3:IBO:(338) (species –  
   Strait of Georgia near & in Fraser River  
   estuary; composite list of, in lower  
   river estuary; diversity; re pelagic  
   entomostracan)  
 : 96 (of Sturgeon Bank re proposed Vancouver  
   airport expansion)  
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   :(395, 401, 402); 2: 79, 80, 81(280, 285,  
   286) (distribution – factors; inlet;  
   Strait of Georgia; in Squamish  
   estuary; Mamquam Channel; seasonal  
   changes; depth)  
   :(400); 2:IBO:(285); 3:IBO:(337); 5:IBO:(252)  
   (identification manual)  
   :(401); 2:IBO:(285) (with respect to whale  
   fisheries)  
   :(401); 2:IBO:(285, 286) (northeastern  
   Pacific Ocean)  
   :(403); 2:IBO:(288) (re grazing)  
 2: 71 (as food of herring & flounder)  
 : 77 (of Mamquam Channel)  
 : 79 (seasonal biomass in estuary & Mamquam  
   Channel)  
 : 79 (summer survival hypothesis)  
 : 79, 80, 81, 82, 173 (abundance – in Squamish  
   estuary; Mamquam Channel; seasonal  
   changes in; re west delta; re fish stomach  
   contents)  
 : 80 (drift organisms)  
 : 80 (habitat)  
 :129 (as primary consumers; feeding strategies)  
 :IBO:(252) (re primary productivity)  
 3:xxii (consumed by freshwater fish)  
 4: 73 (protozoa, rotifera, copepoda & cladocera  
   of Cowichan River system)  
 : 79 (general information; of Chemainus Bay)  
 5: 72 (microzooplankton observations, objectives  
   & status of analysis)  
 :IBO:(254) (Canadian marine)  
 6: 71 (of Kitimat delta)

*Zostera latifolia* (*see also* Eelgrass)  
 1:292 (in species list)

*Zostera marina* (*see also* Eelgrass community)  
 1:132, 133, 138, 147 (along Tsawwassen foreshore,  
   Roberts Bank, Mud, Semiahmoo & Boundary  
   bays)  
 :136 (a small patch by Iona Island jetty)  
 :139 (on beaches of Beach Grove & Crescent Beach)  
 :156 (major food of black brant in Boundary Bay)  
 2:104 (located on Mamquam delta)  
 :208; 3:223; 4:214; 6:211 (in species list)  
 3:106 (estuarine vascular plants)  
 :106 (importance to estuarine ecosystem & food  
   webs, as habitat, food source & shelter)

3:106, 115; 157; 4:107, 108 (locations of)  
 4:107, 108 (abundance & preferred habitats)  
 5:xxvi (estuarine distribution)  
   :xxviii (impact of log booming on)  
 6: 95 (habitat; species dominance; regional  
   concentrations; ecological significance)

*Zostera nana* (*see also* Eelgrass)  
 1:133, 139 (only in three small beds in Boundary  
   Bay)

*Zostera* sp. (*see also* Eelgrass)  
 1: 88, 138, 140, 146 (around southern delta  
   front Point Roberts to White Rock beaches)  
 :IBO:(431) (habitats)  
   :(432); 2:IBO:(306); 4:IBO:(297); 5:IBO:(262,  
   267) (status)  
 2: xx (occur in Mamquam Channel)  
   : 92 (spawning habitat of herring)  
 3:xxiv (inhabits Flora Bank)  
 5: 96 (estuarine importance of)  
   :96, 97, 98; 6: 92 (distribution – of *Zostera-*  
   *Ulva* associations; trends; effecting  
   factors; intertidal)  
   : 97, 98, 143; 6: 92 (abundance – historic &  
   current; in estuary; with respect to  
   sedimentation re logging)  
   : 98 (location & area in estuary)  
 :105 (food resources)  
 :IBO:(263); 6:IBO:(271) (cyclical growth;  
   detritus formation; trophic  
   relationships; inshore resource  
   implications)  
   :(264); 6:IBO:(261) (phosphorus cycling)  
   :(265) (frost tolerance)  
 6:153 (re log handling & storage)

*Zosteraceae* (eelgrass family) (*see* *Zostera*)  
 6:211 (in species list)

Zyblut, E.R.  
 1:111(424) (river lamprey parasitism of salmon  
   in Fraser River mouth)  
 :IBO:(429) (report on Fraser River chum salmon  
   stocks)  
 2:IBO:(301) (parasitism on Pacific juvenile  
   salmon & herring in Strait of Georgia)  
   :(303) (Johnstone Strait - Fraser River  
   study area chum salmon stocks; report)

Zygoptera (damselflies)  
 3: 64 (occasionally found in Lakelse Lake)





